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SCIENTIFIC RESEARCH, FOREST ASSESSMENT AND DEVELOPMENT OF CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

Programme element III.2: Criteria and indicators for sustainable forest management

Report of the Secretary-General

SUMMARY

The present paper reviews the extent and status of on-going activities aimed at the definition of criteria and indicators for sustainable forest management. It examines basic principles, common denominators and comparability of the criteria and indicators presently under development and testing by the ITTO and within the Helsinki, Montreal, Tarapoto and Dry Zone Africa processes. The paper underlines the need for increased, inter-sectoral linkages and improved information exchange to clarify and promote issues underlying the emerging, broadened concept of sustainability in forestry development. It stresses the desirability of urgently arriving at common concepts and terminology, and draws attention to continued and increased need for international dialogue to help facilitate common understanding and compatibility of action between countries and regions. The paper makes some preliminary suggestions for issues on which the Ad Hoc Intergovernmental Panel on Forests may wish to focus its discussions in the future.

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INTRODUCTION

1. This document reports on implementation of decisions of the United Nations Conference on Environment and Development (UNCED) related to the second programme element of Category III, "Scientific research, forest assessment and development of criteria and indicators for sustainable forest management", of the work programme of the Ad Hoc Intergovernmental Panel on Forests. It includes a general overview of the issue, a short update of the current status, followed by a description of the range of considerations for the initial discussion of this programme element at the second session of the Panel.

2. The work under programme element III.2 is guided by the decisions taken by the Commission on Sustainable Development at its third session in April 1995 and further elaborated by the Panel at its first session in September.

3. At the third session of the Commission, the follow-up to UNCED in forestry was reviewed and discussed and the development of criteria and indicators for sustainable forest management was identified as being among the major tasks and priorities for the Panel, which was established within the framework of the Commission. More specifically, the Commission requested the Panel to "encourage national implementation of criteria and indicators for sustainable forest management and study the feasibility of further developing internationally agreed upon criteria and indicators against which progress towards sustainable forest management of all types of forests could be measured, taking into account the specific regional and subregional conditions of forests and the diversity of economic, social and cultural environments". 1/ The Commission further requested that the work of the Panel "facilitate the engagement of regions and countries not yet involved in developing criteria and indicators of sustainable forest management; share experiences in testing and implementing them; and examine the need to promote comparability and the appropriateness of convergence among international initiatives in this regard". 2/

4. At its first session, held in New York from 11 to 15 September 1995, the Panel decided to undertake initial discussion of the issue of criteria and indicators at its second session and requested that "A report for discussion under this item should include, for all types of forests: a review of experience of the development and implementation of national level criteria and indicators; an exploration of ways and means of facilitating the engagement of regions and countries not yet involved in a process for the development of criteria and indicators; and an examination of the need to promote comparability as well as the appropriateness of international compatibility in this regard, should this be judged necessary. Work under this element should take into account regional and subregional characteristics of forests and the diversity of economic, social and cultural environments. The report should consider the progress of various initiatives including those of ITTO, the Helsinki Process, the Montreal Process, the Tarapoto Process as well as the results of FAO/UNEP regional meetings" (E/CN.17/IPF/1995/3, para. 18, III.2). The present paper has been prepared to facilitate discussion in this regard.

5. At its first session the Panel decided to schedule programme element III.2 for initial discussion at the second session, to be held in Geneva from 11 to 22 March 1996.

6. The present report was prepared by the Food and Agriculture Organization of the United Nations (FAO) as lead agency for programme element III.2, in consultation with the secretariat of the Ad Hoc Intergovernmental Panel on Forests in the Division for Sustainable Development of the Department for Policy Coordination and Sustainable Development of the United Nations Secretariat. Comments and inputs were also received from the World Bank.

7. The report is an initial response to the request of the Panel at its first session, taking into account the complexity of the subject and the fact that the Panel had decided on an initial discussion of this topic at its second session and a substantive discussion at its third session.

8. The pivotal role of all types of forests in sustainable development was recognized at the UNCED Conference. The Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests (the "Forest Principles"), 3/ agreed upon at the Conference, underlined the need to reconcile the productive functions with the protective, environmental and social roles performed by forests.

9. Consistent with the Forest Principle 8 (d), and in accordance with principles contained in chapter 11 of Agenda 21 of UNCED, "Combating Deforestation", Governments agreed to pursue, in cooperation with special interest groups and international organizations, "the formulation of scientifically sound criteria and guidelines for the management, conservation and sustainable development of all types of forests" (sect. 11.22 (b)).

10. The above agreements constituted major catalysts to actions aimed at the definition of criteria and indicators for sustainable forest management at regional and national levels. Criteria and indicators for sustainable forest management also constituted a major focus of several international post-UNCED meetings. The Seminar of Experts on Sustainable Development of Boreal and Temperate Forests organized by the Conference on Security and Cooperation in Europe (CSCE), held in October 1993 in Montreal, Canada, contributed to the Helsinki and Montreal Processes. The significance of criteria and indicators was underlined in the Bandung Declaration, arising from the Global Forest Conference, organized by the Government of Indonesia (February 1993); the New Delhi resolution, passed by the international workshop, Towards Sustainable Forestry: preparing for the Commission on Sustainable Development 1995 (July 1994), organized jointly by India and the United Kingdom of Great Britain and Northern Ireland; and the conclusions and recommendations of the workshop, Science, Forests and Sustainability - a policy dialogue, organized jointly by the Government of Indonesia and the Centre for International Forestry Research (CIFOR) (December 1994), and the Tarapoto Proposal of the Amazon Cooperation Treaty. The two meetings of the Inter-Governmental Working Group on Global Forests (April 1994 and October 1994), sponsored jointly by the Governments of Malaysia and Canada, also included criteria and indicators for sustainable forest management among the seven items discussed. 4/

I. OVERVIEW OF CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

11. Sustainable forest management is commonly viewed as one of the most important contributions which the forestry sector can make to sustainable development objectives of many nations, particularly those richly endowed with forests.

12. In general terms, sustainable forest management deals with the administrative, economic, social, legal, technical and scientific aspects of the conservation and sustainable use of forests within the framework of technically sound and politically accepted national land-use plans. It implies various degrees of human intervention, ranging from action aimed at safeguarding and maintaining the structure and function of forest ecosystems, to favouring socially or economically valuable species or groups of species for the improved production of goods and environmental services.

13. In operational terms, sustainable forest management includes the formulation and implementation of forest management plans, which help to control and regulate harvesting of specified goods, combined with silvicultural and protective measures applied in varying intensity to sustain or to enhance the social, ecological and economic value of subsequent generations of the managed forests.

14. During the past decade, the perspective on forests has evolved from management of forests largely for sustained yield of wood to environmentally sustainable forest management. This changing perspective may be described as follows:

> Sustained yield of wood, timber and other products, such as fruits and berries, fodder, gum arabic, tannins, cork, game animals etc. has for decades, in some cases for centuries, been a stated aim of forest management in many countries around the world. Harvesting of priority products, especially in developed countries, was frequently combined with the provision of selected environmental services (notably maintenance of the biological resource base, including the wildlife and the conservation of soil and water) and, with efforts to enhance recreation and aesthetic values of forests and woodlands for an increasingly urbanized human population. Social aspects and multiple benefits have been, and continue to be, at the centre of forestry activities in diverse conditions such as, for example, those in Finland (smallholder forestry for wood and timber production, for sustenance and off-season income generation of farmers), and the Sudan (income generation from the collection of gum arabic from the fallow crop by small-scale farmers).

15. Environmentally sustainable forest management recognizes that forests simultaneously provide a wide range of socio-economic, environmental and cultural benefits, values and services at the local, national, regional and global levels. Forests are no longer viewed as primarily a source of industrial or fuel wood but as complex ecosystems that need to be maintained in a healthy state for the benefit of present and future generations. A shift from sustained

yield to sustainable forestry requires a corresponding shift from forest management to forest ecosystem management.

16. Approaches to the implementation of environmentally sustainable forest management are yet in a state of infancy. Lack of implementation is partially attributed to lack of resources, expertise and political commitment and to insufficient availability of factual and scientific information on, for example, successional change and variables such as growth and yield of tree species under varying intensities of forest management, relationship between harvesting practices and forest ecosystem functions etc. The lack of scientifically sound information is even more acute in relation to ecological processes on which increasing emphasis has been made in recent years. These include information on, for example, long-term influence of varying intensities of harvesting of wood and non-wood products on associated species and on-site productivity in different climatic and soil conditions; ecosystem dynamics; evolution and evolutionary potential of forest-dependent species; the role and importance of intra-specific variation in the buffering of forest ecosystems against environmental change etc. Information is also largely lacking on a range of social and economic variables, without which the balancing of the various components of sustainability, as defined at UNCED, cannot be assured.

17. In accordance with forest-related agreements reached at UNCED, the use and potential of forests should include productive, protective and environmental functions. There is now an urgent need to reach international consensus on the principal elements of sustainable forest management. There is, however, a need to ensure wide, field-level application of forest management practices that satisfy the notion of sustainable forest management.

18. Criteria and indicators are tools that can be employed both in characterization and in implementing, or moving towards sustainable forest management in its broadest sense.

19. The role of criteria is to characterize or define the essential elements of forest management against which the sustainability of forestry practices may be assessed. Each criterion relates to a key element of sustainable forestry and may be characterized by one or more related quantitative, qualitative (i.e. descriptive) indicators. Through periodic measurement and monitoring of these indicators, the overall impact of forest management interventions, or effects of non-intervention, can be assessed and corrective action undertaken to meet stated aims and objectives.

20. Criteria and indicators may be identified at various geographic levels: global, regional (and eco-regional), national and subnational, i.e. the forest management unit level. Criteria and indicators are essential to: 5/

(a) Characterize sustainable forest management (criteria) and to provide quantitative and qualitative yardsticks (indicators) to assess progress towards sustainable forest management;

(b) Formulate policies, regulations and guidelines governing sustainable forest management;

(c) Monitor national, regional and global progress towards sustainable forest management and reporting;

(d) Clarify issues related to certification of forest products from sustainably managed forests;

(e) Develop consensus on concepts, terms and related vocabulary to facilitate ongoing international dialogue on sustainable forest management;

(f) Facilitate international cooperation and assistance aimed at sustainable forest management.

21. At the level of forest management unit, it should be noted that all national and/or internationally agreed criteria for sustainability may not be fully applicable. For example, a particular forest management unit with limited forest areas may not be significant in terms of biological diversity or carbon sequestration. However, at the national aggregate level, the applicable criteria must meet the acceptable levels of performance in order to maintain forests as healthy ecosystems.

22. Accordingly, it would be generally acceptable to prioritize and assign a priority status among agreed criterion and to its related indicators in any one forest area to reflect local circumstances.

23. Over the past years, attempts have been made, in a number of international initiatives, to identify criteria and define indicators corresponding to each criterion. The number of countries involved in these initiatives, and the ecological region and the area covered by each is summarized in table 1.

24. A review of these ongoing initiatives shows that the criteria in all of the given initiatives include the following six elements:

(a) Extent of forest resources (table 2)

(b) Biological diversity (table 3)

(c) Health and vitality (table 4)

(d) Productive functions (table 5)

(e) Protective and environmental functions (table 6)

(f) Development and social needs (table 7)

In addition, all initiatives except the Helsinki process, include the criterion:

(g) Legal policy and institutional framework (table 8). 6/

Table 1. Coverage of ongoing initiatives on criteria and indicators for sustainable forest management by ecological region a/

Ecological region and initiative a/	Number of countries	Forest area (thousand hectares) b/
Temperate and boreal forests c/		
Helsinki Process (incl. Russian Federation)	38 d/	904 577
Montreal Process (incl. Russian Federation)	12 e/	1 500 000
Tropical forests		
ITTO producer countries f/	25	1 305 046
Tarapoto Proposal g/	8	540 000 h/
Dry-zone forests		
Sub-Saharan dry-zone Africa i/	27	278 021
Initiatives planned		
North Africa and the Near East	18	10 573

a/ As of December 1995.

b/ Information on forest area is taken from FAO forestry papers, No. 112 and No. 124.

c/ Some countries are represented in more than one initiative, notably Russia (with a forest area of 739,728,000 ha), which is included in both the Helsinki and the Montreal processes.

d/ The number of countries refers to signatory States to Helsinki resolutions H1 and H2; plus those newly independent States that subsequently participated in the work of the Helsinki Process; plus Albania (which did not originally sign the resolutions, but which has participated in the work of the Helsinki Process recently). See note 7 to main text for list of participating countries.

e/ Argentina and Uruguay joined the Montreal Process at its seventh session in New Zealand in November 1995. See note 8 to main text for list of participating countries.

f/ At the end of 1995, ITTO had 54 member countries. The forest area indicated in the present table includes that of the 25 producer countries which are members of the organization.

g/ Of the eight participating countries, only Suriname is not a member of ITTO. See note 9 to main text for list of participating countries.

h/ Amazonian forests only.

i/ Including member countries of the permanent Inter-State Committee on Drought Control in the Sahel (CILSS), the Intergovernmental Authority for Drought and Development (IGADD) and the Southern Africa Development Community (SADC).

The extent of compatibility of various criteria and associated indicators between five initiatives is remarkably significant (tables 2-8).

Table 2. Review of national level indicators of the criterion "Extent of resources", included under various initiatives

Extent of forest resources indicators	HELS.	MONT. a/	ITTO	TARA.	Dry-Z Africa
Area of forest cover	Yes	-	Yes	Yes	Yes b/
Wood-growing stock	Yes	-	-	No	Yes
Carbon stock	Yes	Yes	-	No	-
Successional stage	-	Yes	-	Yes	No
Age structure	Yes	Yes	Yes	No	No
Rate of conversion of forest cover to other uses	-	-	-	Yes	Yes

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: Proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the indicator in question.

a/ The extent of the forest resources is not expressed as an explicit criterion in the Montreal Process.

b/ Including other wooded lands and plantations (and their changes over time).

Table 3. Review of national level indicators of the criterion "Biological diversity", included under various initiatives

Biological diversity indicators	HELS.	MONT.	ITTO	TARA.	Dry-Z Africa
Ecosystem					
Distribution of forest ecosystems	Yes	Yes	-	Yes	Yes
Extent of protected areas	Yes	Yes	Yes	Yes	Yes
Fragmentation	-	Yes	-	No	Yes
Area cleared annually, containing endemic species	-	-	-	No	Yes
Area and percentage of forest lands with fundamental ecological changes	-	-	-	Yes	No
Species					
Number of forest-dependent species	Yes	Yes	-	Yes	Yes
Number of forest-dependent species at risk	Yes	Yes	-	Yes	Yes
Extent of mixed stands	Yes	-	-	-	No
Reliance on natural regeneration	Yes	-	-	Yes	Yes
Resources exploitation systems used	No	No	-	No	Yes
Measures for in situ conservation of species at risk	-	-	-	Yes	No
Genetic					
Number of forest-dependent species with reduced range	-	Yes	-	-	Yes
Population levels of key species across their range	-	Yes	-	Yes	Yes
Management of genetic resources	Yes	-	-	Yes	Yes
Average number of provenances	No	No	-	No	Yes

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: Proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the indicator in question.

Table 4. Review of national level indicators of the criterion "Health and vitality", included under various initiatives

Health and vitality indicators	HELS.	MONT.	ITTO	TARA.	Dry-Z Africa a/
External influence					
Deposition of air pollutants	Yes	Yes	No	-	No
Climate change	-	-	No	Yes	No
Drought	No	No	No	No	Yes
Damage by wind erosion	No	No	-	No	Yes
Forest vitality					
Incidence of defoliation	Yes	Yes	-	-	No
Reproductive health	-	Yes	-	Yes	-
Bush encroachment	No	No	No	No	Yes
Forest influence					
Insect/disease damage	Yes	Yes	-	Yes	Yes
Fire/storm damage	Yes	Yes	-	Yes	Yes
Wild animal damage	Yes	-	-	-	Yes
Anthropogenic influence					
Domestic animal browse damage	Yes	Yes	No	No	Yes
Competition from introd. plants	-	Yes	-	No	Yes
Nutrient balance and acidity	Yes	-	-	Yes	Yes
Trends in crop yields	No	No	No	No	Yes
Percentage of population employed in crop/livestock farming	No	No	No	No	Yes

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: Proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the indicator in question.

a/ In the Dry-Zone African proposals, the full title of this criterion is: "Health, vitality and integrity".

Table 5. Review of national level indicators of the criterion "Productive functions", included under various initiatives

Productive functions indicators	HELS.	MONT.	ITTO	TARA.	Dry-Z Africa
Percentage of forests/other wooded lands managed according to management plan	Yes	Yes	Yes	Yes	Yes
Growing stock	-	Yes	Yes	No	Yes
Wood production	Yes	Yes	Yes	Yes	Yes
Production of non-wood forest products	Yes	Yes	-	-	Yes
Carbon sequestration	-	Yes	No	No	No
Annual balance between growth and removals of wood products	Yes	Yes	Yes	Yes	Yes
Level of diversification of sustainable forest production	No	No	-	Yes	No
Degree of utilization of environmentally friendly technology	No	No	-	Yes	No

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: Proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the indicator in question.

Table 6. Review of national level indicators of the criterion "Protective and environmental functions", included under various initiatives

Protective and environmental functions indicators	HELS.	MONT.	ITTO	TARA.	Dry-Z Africa
Soil conditions	-	Yes	Yes	Yes	-
Water conditions	-	Yes	Yes	Yes	-
Management for soil protection	Yes	Yes	Yes	Yes	Yes
Watershed management	Yes	Yes	Yes	Yes	Yes
Areas managed for scenic and amenity purposes	-	-	-	Yes	Yes
Areas and percentages of forest lands managed for environmental protection	-	-	-	Yes	-

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: Proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the indicator in question.

Table 7. Review of national level indicators of the criterion "Developmental and social needs", included under various initiatives

Developmental and social needs indicators	HELS.	MONT.	ITTO	TARA.	Dry-Z Africa
Economic benefits					
Value of wood products	-	Yes	Yes	Yes	Yes
Value of non-wood products	-	Yes	Yes	Yes	Yes
Hunting and recreation	Yes	Yes	-	Yes	Yes
Share of forest sector in GNP/GDP	Yes	Yes	-	Yes	Yes
Value from primary and secondary industries	No	Yes	-	No	Yes
Value from biomass energy	No	No	No	No	Yes
Forest sector trade balance	No	-	No	-	Yes
Investment in forests and forest industries	Yes	Yes	-	Yes	Yes
Economic profitability of sustainable forest management	No	-	-	Yes	No
Efficiency and competitiveness of forest product production and processing	No	No	-	Yes	No
Rate of return on forest investments	No	Yes	No	Yes	No
Rate of recycling of forest products	No	Yes	No	No	No
Distribution of benefits					
Employment generation/conditions	Yes	Yes	Yes	Yes	Yes
Cultural, social and spiritual values	Yes	Yes	Yes	Yes	Yes
Forest-dependent communities	-	Yes	Yes	Yes	Yes
Subsistence use/food security	-	Yes	-	Yes	Yes
Average per capita income in different forest sector activities	No	-	-	Yes	No
Impact of the economic use of forests on availability of forests for local people	No	Yes	Yes	Yes	No
Quality of life of local populations	-	-	Yes	Yes	Yes
Other					
Research, development and education (level of expenditure)	-	Yes	-	Yes	-
Relation between direct and indirect uses of forests	No	No	No	Yes	No

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: Proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the indicator in question.

Table 8. Review of national level indicators of the criterion "Legal, policy and institutional framework", included under various initiatives

Legal, policy and institutional framework indicators	HELS. a/	MONT.	ITTO	TARA.	Dry-Z Africa
National forest policy, legislation and regulations	-	Yes	Yes	Yes	Yes
Institutional instruments and tools	-	Yes	Yes	Yes	Yes
Concrete implementation and capacity to monitor	-	Yes	Yes	Yes	Yes
Economic framework and financial instruments	-	Yes	Yes	Yes	Yes
Community consultation and information tools	-	Yes	Yes	Yes	Yes
Research and development capacity	-	Yes	Yes	Yes	Yes
Valorization of local expertise, knowledge and technologies	-	Yes	Yes	Yes	Yes
Transfer and adaptation of appropriate technologies	-	-	Yes	Yes	Yes
Capacity to implement international instruments	No	No	Yes	Yes	No

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: Proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the indicator in question.

a/ In the Helsinki Process, this criterion is covered by descriptive indicators identified within each of the six identified criteria.

II. CURRENT STATUS

A. International initiatives prior to UNCED

25. Prior to UNCED, guidelines for the sustainable management of natural tropical forests had been elaborated in 1990 under the auspices of the International Tropical Timber Organization (ITTO), followed by the definition of ITTO criteria for monitoring of sustainability in tropical moist forests, published in early 1992. Subsequently, in 1993, these were supplemented by guidelines for the establishment and sustainable management of planted tropical forests, and by guidelines on the conservation of biological diversity in tropical production forests. In continuation of this work, ITTO is presently developing guidelines for the protection of tropical forests from fire, guidelines for sustainable forest industries, and guidelines for the sustainable management of tropical tidal forests.

B. Post-UNCED initiatives

26. Since UNCED was held in Rio in 1992, significant progress has been made on defining criteria and indicators of sustainable forest management at the intergovernmental forest management level; and work has now started at field testing of these criteria and indicators.

1. Intergovernmental initiatives for action at the national level

27. Since UNCED, criteria and indicators for sustainable forest management have been formulated through several international and national, governmental and non-governmental initiatives. Intergovernmental activities in this respect have been conducted mainly within the framework of three major international initiatives.

28. The Helsinki Process focuses on the development of criteria and indicators for the sustainable management of European forests, 7/ in line with principles laid down in two ministerial conferences on the protection of forests in Europe (Strasbourg 1990, Helsinki 1993). The European countries have agreed upon 6 criteria, 20 quantitative indicators, and a number of descriptive indicators for sustainable forest management. These are presently being tested by countries concerned. A consolidated report on national-level performance in these criteria and indicators was presented at the third meeting of the Commission for Sustainable Development in April 1995.

29. The Montreal Process is carried out in follow-up of the CSCE Seminar of Experts on Sustainable Development of Temperate and Boreal Forests, held in Montreal in September-October 1993, and deals with the definition of criteria and indicators for sustainable forest management in temperate and boreal forests outside Europe. The 12 participating countries 8/ agreed in February 1995 on a set of 7 non-legally binding criteria and 67 indicators for sustainable forest management, identified for national implementation. The area covered by the

Montreal Process encompasses forests in the northern as well as the southern hemisphere and includes both developing and developed countries.

30. The Tarapoto Proposal of Criteria and Indicators for Sustainability of the Amazon Forest, was adopted in February 1995 in Tarapoto, Peru, in a meeting held under the auspices of the Amazon Cooperation Treaty. 9/ Within the framework of this initiative, 7 criteria and 47 indicators were identified for national-level implementation. Criteria and indicators were also identified for implementation at forest management unit and global levels. The recommendations and conclusions of the meeting have been subsequently submitted to the Governments of countries concerned for their approval and ratification.

31. A UNEP/FAO Expert Meeting on Criteria and Indicators for Sustainable Forest Management in Dry-Zone Africa, was held in Nairobi, on 21-24 November 1995. This initiative, its background and outcome, is described in more detail in paragraphs 41-43 below.

32. In addition to the above initiatives, there have been moves towards starting an intergovernmental process on the development of criteria and indicators for sustainable forest management in Central America, under the auspices of the intergovernmental Central American Commission for Environment and Development (Comisión Centroamericana de Ambiente y Desarrollo (CCAD)). A workshop or an expert meeting, to be organized by the Central American countries in collaboration with FAO and other interested agencies and institutions, is preliminarily planned to be held during 1996.

33. Notable progress has been made in further elaboration of criteria and indicators at the national level, through multi-State holder consultation processes in Finland and Canada.

2. Action at forest management unit level by Governments and non-governmental organizations

34. Over the past few years, the above intergovernmental initiatives have been complemented by a number of national activities carried out by both governmental agencies and national and international non-governmental organizations. The activities of the latter include, inter alia, those of the Forest Stewardship Council (FSC) and the World Wide Fund for Nature (WWF), which are both aimed at the identification of criteria and indicators at the forest management unit level. In addition, the FSC offers its services to national Governments as a "certifier of certifiers" for forest products moving in international trade.

3. Field testing of criteria and indicators at national and forest management unit levels

35. Simultaneously with the intergovernmental action taken to date or planned, it has been recognized that as an integral part of such work, the processes leading towards sustainable forest management should not be limited to the identification of criteria and indicators, but should include their testing, as well as field level, pilot-scale implementation.

36. Internationally coordinated efforts in the testing of criteria and indicators at the forest management unit level are under way under the project, "Testing Criteria and Indicators for Sustainable Management of Forests". This project is coordinated by CIFOR in collaboration with several governmental and non-governmental organizations in tropical and temperate countries. The project aims at identifying those criteria and indicators that can be considered objective, cost-effective and relevant in the assessment of the sustainability of prevailing forest management practices, taking into account parameters related to ecological, institutional, social and economic conditions and needs. The project includes field trials in a number of countries in tropical and temperate regions.

37. Interested countries are, furthermore, benefiting from work coordinated by Canada within the framework of its national and international "Model forests" programmes. This initiative involves the implementation of selected stand-level criteria and indicators, carried out at pilot level in a number of developed and developing countries. The Working Group on Timber Certification, a European initiative under the auspices of the Timber Committee of the Economic Commission for Europe (ECE) and FAO, is reviewing the potential role of forest-level criteria and indicators for the certification of forest products. A report on this work was presented to the ECE Timber Committee in November 1995.

38. In relation to future activities to be carried out in support of the deliberations of the Ad Hoc Intergovernmental Panel on Forestry, the Government of Finland offered, at the third session of the Commission in 1995, to promote and encourage national implementation and further development of criteria and indicators for sustainable forest management as well as their comparability and international compatibility.

III. EFFORTS TOWARDS THE EXTENSION OF THE PRESENT COVERAGE AND COMPARABILITY BETWEEN INITIATIVES

39. From 13 to 16 February 1995, FAO in collaboration with ITTO, organized an Expert Meeting on the Harmonization of Criteria and Indicators for Sustainable Forest Management. The meeting included experts from countries and organizations involved in the international processes and initiatives mentioned above, as well as experts knowledgeable of those geographical and ecological regions which, at the time, had not been involved in international activities in this field. The aims of the meeting were to: (a) review the thematic and geographical coverage of ongoing, national-level initiatives on criteria and indicators for sustainable forest management; (b) seek ways and means of involving countries and regions not covered by such initiatives; and (c) promote comparability, and possible harmonization, of ongoing initiatives.

40. In line with the recommendations of the FAO/ITTO Expert Meeting, the twelfth session of the Committee on Forestry (COFO) (Rome, 13-16 March 1995), requested

> "that FAO, in collaboration with other international organizations concerned, promote the exchange of information, research results, data and experience between and among [ongoing and forthcoming] initiatives, and

involve countries which had not to date been part of ongoing international initiatives".

The Rome Statement on Forestry, issued by the ministers responsible for forestry, meeting in Rome on 16-17 March 1995, emphasized the need to

> "continue to develop and apply criteria and indicators for the sustainable management of all types of forests, and to demonstrate and evolve the concept of sustainable forest management through their application, taking into account specific regional and subregional conditions as well as the need to promote comparability in international initiatives in this regard".

41. The FAO/ITTO Expert Meeting noted that, among others, arid and semi-arid areas of Africa and the Near East had not received attention under the international initiatives related to the identification of criteria and indicators; and that the environmental conditions and socio-economic needs governing forest management in these areas in which forestry played an essential role in the survival and sustenance of local human populations, was likely to require special, complementary or additional considerations not evident in ongoing initiatives.

42. In consideration of the above, and in consultation with other international stakeholders including the secretariat of the Commission, FAO and the United Nations Environment Programme (UNEP) jointly organized an Expert Meeting to discuss criteria and indicators for sub-Saharan, dry-zone African countries (Nairobi, 21-24 November 1995).

43. The Expert Meeting requested UNEP and FAO to draw the conclusions and recommendations of the meeting to the attention of the forthcoming African Ministerial Conference on the Environment (1996) at its sixth session; and to inform the secretariats of the Comité inter-Etats de lutte contre la sécheresse au Sahél (CILSS) and the Intergovernmental Authority on Drought and Development (IGADD), as well as the Forestry Sector Technical Coordination Unit of the Southern Africa Development Community, of the outcome of the Expert Meeting, for appropriate national-level action under overall, subregional coordination. FAO and UNEP were also requested to inform the panel of the outcome of the meeting; and to help to ensure comparability and global compatibility of action taken.

44. The report of the UNEP/FAO Expert Meeting was submitted to the African Forestry and Wildlife Commission at its tenth session, held in South Africa from 27 November to 1 December 1995. The Commission endorsed the information contained in the report, and reiterated the call for further, subregional and regional consultation. It also stressed the need for early testing and implementation of the national-level criteria and indicators identified in the Expert Meeting.

45. FAO plans to organize a similar expert meeting for the Mediterranean climate, North African and Near East countries, in collaboration with other, concerned international organizations. The meeting will be held in October 1996 just prior to the twelfth session of the Near East Forestry Commission. The conclusions and recommendations of the Expert Meeting will be submitted to the Commission for consideration.

46. The degree of compatibility among the five initiatives can be assessed in tables 2 to 8. It seems possible to arrive at a core set of globally agreed-upon national-level criteria and a small number of corresponding, common indicators, to assist in a shift towards sustainable management of all types of forests (table 9).

47. Within the framework of the activities of the panel, the Government of Finland has offered to organize a meeting to help further coordinated, global action in the identification and in field testing and verification of national-level criteria and indicators for sustainable forest management. This Intergovernmental Seminar on Criteria and Indicators for the Sustainable Management of Forests (ISCI) will, according to plans, be organized by Finland, from 19 to 22 August 1996. A first meeting of an International Contact Group, established by the Finnish Government to advise and help prepare for the ISCI, was held in Finland on 17-18 December 1995.

48. As outlined in the preceding section, UNCED stressed the need to ensure that all kinds of forests are wisely managed and that the contribution of forests and the forestry sector to the sustainable development of nations is fully realized. Over the past years, the commitment made at Rio has been translated into a number of international, regional and national-level efforts to define commonly acceptable criteria for sustainable forest management, and to identify indicators for each of these criteria.

Table 9. Summarized overview of criteria

Criteria	HELS.	MONT.	ITTO	TARA.	Dry-Z Africa
Levels					
Forest management unit	No	No	Yes	Yes	No
National	Yes	Yes	Yes	Yes	Yes
Global	No	No	No	Yes	No
Thematic categories					
Forest resources:					
Extent of forest resources	Yes	a/	Yes	c/	Yes
Global carbon cycles	Yes	Yes	No	No	d/
Forest ecosystem health and vitality	Yes	Yes	No	-	Yes
Biological diversity in forest ecosystems	Yes	Yes	b/	Yes	Yes
Forest functions:					
Productive functions of forests	Yes	Yes	Yes	Yes	Yes
Protective and environmental functions of forests	Yes	Yes	Yes	Yes	Yes
Development and social needs:					
Socio-economic functions and conditions	Yes	Yes	Yes	Yes	Yes
Institutional framework:					
Policy and legal framework, capacity to implement sustainable forest management	-	Yes	Yes	Yes	Yes

Key: HELS.: European Process; MONT.: Montreal Process; ITTO: International Tropical Timber Organization; TARA.: Tarapoto Proposal; Dry-Z Africa: proposal for the sub-Saharan dry-zone African countries. "Yes": indicator is explicitly mentioned in the initiative; dash (-): indicator is not fully enunciated, although it may have been implicitly considered; "No": no explicit or implicit reference has been made to the criterion in question.

(Footnotes on following page)

(Footnotes to table)

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a/ In the Montreal Process, the forest resource is not considered a separate criterion, but an indicator for two other criteria: (a) conservation of biological diversity; and (b) maintenance of the productive capacity of forest ecosystems.

b/ ITTO has developed a set of supplementary guidelines, addressing the issue of biological diversity, rather than including this as a criterion in its forest management guidelines.

c/ In the Tarapoto Proposal the criteria: "Extent of forest resources" and "Biological diversity", are merged into a single criterion: "Conservation of forest cover and of biological diversity".

d/ In the Dry-Zone African proposal, the criteria: "Global carbon cycles" and "Extent of forest resources", are merged into a single criterion.

IV. HIGHLIGHTS OF EXPERIENCES: LESSONS LEARNT

A. Definitions of national-level criteria and indicators

49. In this regard, the Helsinki Process has concentrated on the geographic region of Europe and thus covers boreal-, temperate- and Mediterranean-type forests. Other initiatives, in turn, have been based on ecological regions, or a combination of geographic and ecological regions. For example, ITTO's Guidelines and Criteria, covers forests of ITTO producer countries in all tropical regions; the Montreal Process encompasses the temperate and boreal zone forests outside Europe in both the northern and southern hemispheres; the Tarapoto Proposal includes humid tropical, tidal and riverine forests in the Amazon basin; and the recent UNEP/FAO Dry-Zone Sub-Saharan Africa initiative covers the arid, semi-arid and dry sub-humid-zone forests and woodlands.

50. In the initiatives described above, a range of institutional approaches were employed. Whereas the Helsinki and Tarapoto proposals were initiated under the umbrella of a political institutional framework, the Montreal Process was driven by the desire of like-minded countries to work together towards a shared objective. From a biological and silvicultural point of view, an eco-regional approach facilitates technical and scientific level dialogue and the formulation of proposed strategies of action. On the other hand, there is a need to ensure early endorsement of recommendations of expert level meetings by intergovernmental forums to ensure their political acceptance and, thus, national implementation. Such policy level forums often operate at subregional or regional, in addition to global, levels.

51. The step-wise approach used in many of the ongoing initiatives in the development of criteria and indicators for sustainable forest management, includes early dialogue and regular reviews and refinement at technical and scientific level, complemented by subsequent policy level discussions and endorsement of principles developed. The new and emerging initiatives in this field may wish to examine this approach based on both ecological regions and political (regional and subregional) groupings. The forthcoming FAO Expert Meeting in October 1996 will focus on dry-zone, Mediterranean and sub-temperate forests in North Africa and the Near East, and cover those countries which collaborate within the framework of the Near East Forestry Commission; the Central American initiative, presently in the planning stages, is likely to cover humid and sub-humid forests and woodlands and involve countries collaborating within the framework of the CCAD. In summary it can be concluded that both technical and scientific agreement and policy level approval and endorsement, are essential for success.

52. Many recent forums concerned with the issue of criteria and indicators for sustainable forest management at national level have consistently recommended further strengthening international dialogue and ongoing efforts on this topic. In these forums, special reference has been made to the need to expand activities to cover all kinds of forests, with a view to arriving at a complete global coverage of clearly defined criteria and indicators of sustainable forest management, applicable to countries in all geographic and ecological regions of the world. Accordingly, encouragement of country-driven, eco-regional and other regional initiatives, carried out under an international umbrella, that can

complement ongoing initiatives, may be considered. There is a need to provide, to the extent possible, international guidance and support to these initiatives.

53. To promote common understanding there has, further, been a general consensus that the use of internationally agreed-upon concepts and commonly accepted methodologies for measurement and evaluation, should be actively and vigorously promoted. 10/ Whenever possible, already existing and accepted international terminology should be employed to help to further international dialogue, promote comparability and compatibility between initiatives and, eventually, to help to facilitate possible harmonization of initiatives. 11/

54. Throughout the development of the various processes and initiatives concerned with criteria and indicators of sustainable forest management, there has been frequent contacts between them. It is essential that vigorous dialogue continue to be facilitated among such initiatives, as well as between ongoing initiatives and new and emerging ones, in order to share experiences and to ensure that recommended actions are mutually compatible. Regular dissemination of information should be one of the aims of a globally coordinated programme on criteria and indicators for sustainable forest management.

55. Experience has shown that there are often gaps in the flow of information and understanding, at both international and national levels, between the various sectors, with regard to the development of criteria and indicators aimed at defining, measuring and monitoring of sustainability. It will be of utmost importance to more strongly link relevant activities in forestry to existing, global conventions and to efforts in other sectors, such as e.g. those related to combating desertification (follow-up to chapter 12 of UNCED), sustainable mountain development (chapter 13), and conservation of biological diversity (chapter 15), to ensure that action taken in each individual sector is conceptually understood by, and compatible with that of, other sectors, and that it fully contributes towards common, defined national development goals without causing detrimental, inter-institutional friction.

B. Links between national and forest management unit level activities

56. International initiatives related to sustainable forest management have been largely focused on the development of national-level criteria and indicators in support of improved forest management practices in the countries concerned. This focus is likely to continue in the future given. However, countries engaged in international trade in forest products are likely to increasingly strive to complement criteria and indicators at the national level with practices at the forest management unit level, with a view to facilitating future forest product certification.

57. As stressed above, criteria and indicators defined at the national level are aimed at improving the quantity and quality of information available to decision makers and the general public about progress towards sustainable forest management, and thus to assist in the policy and decision-making process; the ultimate aim in this regard is to further improve forest management practices over time. Forest management unit level criteria and indicators defined and

implemented in support of forest product certification, on the other hand, are mainly aimed at setting performance standards, and to define acceptable forest management practices for specific forest areas.

58. The scope and purpose of criteria and indicators at the national level, and at the forest management unit level, are thus decisively different, all national-level criteria and indicators may not be directly applicable in support of programmes aimed at forest product certification. On the other hand, it is important that criteria and indicators developed at the forest management unit level to underpin certification programmes, are compatible with those defined at the national level. Furthermore, national-level criteria and indicators can help to guide the definition of forest management unit level criteria and the identification of corresponding indicators. These two levels should, therefore, be conceptually linked and compatible.

59. For the third session of the Panel, the Secretary-General will prepare a report presenting further proposals for action guided by the preliminary discussion of the Panel at its second session. During the first session the Government of Finland made a proposal to sponsor an Intergovernmental Seminar on Criteria and Indicators for Sustainable Forest Management. The Seminar will be held in Helsinki, Finland, on 19-22 August 1996, and will produce comprehensive documentation on the issue of criteria and indicators for sustainable forest management, as well as provide options and opportunities for the use of the Panel at its third session.

V. PRELIMINARY SUGGESTIONS FOR ITEMS FOR DISCUSSION

60. In the light of the contribution that the application of national-level criteria and indicators can provide to the management of all types of forests, and in the light of past experiences, ongoing processes and planned, new initiatives documented in the present paper, the Panel may wish to focus discussion on the following issues:

(a) Possibilities for developing a global consensus on concepts, terms and definitions, concerned with sustainable forest management;

(b) Ways and means to further expand and intensify activities in the identification of socio-economically, environmentally, biologically and institutionally relevant criteria and indicators for sustainable forest management, with special reference to promoting national initiatives in those ecological and geographic regions or subregions which are presently not covered by, nor are participating in, ongoing international initiatives; and the need for special ways and means to assist those developing countries in which forests and woodlands are essential in meeting basic subsistence needs of rural populations and forest dwelling peoples;

(c) Possibilities and practical ways to conceptually link ecological zones in different geographic regions of the world (for example, dry zones in Africa, the Near East, Asia, tropical/sub-tropical America and the Caribbean), as a first step towards internationally compatible criteria and indicators of sustainable management of all types of forests;

(d) Research and methodologies to quantify indicators presently recorded as qualitative and descriptive; and encouragement of objective monitoring of related national trends over time;

(e) Possibilities of forging closer links between action related to the ITTO "Target 2000" with other ongoing international initiatives aimed at the definition of criteria and indicators for sustainable forest management;

(f) Mechanisms to ensure the continued, dynamic development and promotion of national, field-level application of criteria and indicators within the framework of ongoing, international processes by countries concerned; 12/

(g) Ways and means to further expand and develop activities related to the field testing of indicators; to promote their standardized measurement and monitoring; and the development of common methodologies for the storage and easy retrieval of corresponding data, for country level analysis and evaluation; development of rapid assessment methods;

(h) Linkages with the work in forest management and forest resources assessment; 13/

(i) Ways and means to maximize the exchange of information, experiences and know-how at global level in all issues related to criteria and indicators for sustainable forest management; and to promote cross-sectoral linkages;

(j) Further examination and clarification of links between the national-level and forest management unit level activities.

Notes

1/ See Report of the Commission on Sustainable Development on its third session, Official Records of the Economic and Social Council, 1995, Supplement No. 12 (E/1995/32), chap. I, sect. D, annex I, III.2.

2/ Ibid.

3/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex III.

4/ For a summary of initiatives and meetings, see also the special publication (1995) by the Commonwealth Forestry Association: "The World's Forests: International Initiatives since Rio". A. J. Grayson, ed. (available from Oxford Forestry Institute, South Parks Road, OX1 3RB Oxford, United Kingdom).

5/ See the outputs of the Helsinki, ITTO, Montreal, Tarapoto and Dry-Zone Africa initiatives as well as the deliberations at the Seminar of Experts on Sustainable Development of Boreal and Temperate Forests organized by the

Conference on Security and Cooperation in Europe, held at Montreal, Canada, September-October 1993.

6/ The titles of the seven criteria, as listed, are for illustrative purposes only. They describe common principal features and elements. The titles are intended to convey the intent of these seven criteria, incorporated in different initiatives.

7/ The European Process includes, in principle, temperate, boreal and Mediterranean-type forests. The following countries are signatories of the relevant Helsinki resolutions H1 and H2: Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland. In addition, Albania has applied and reported upon the criteria and indicators of the European Process, in spite of not having, originally, signed the corresponding resolutions in Helsinki. The European Union has also ratified resolutions H1 and H2.

8/ Participating countries 1993-1995: Australia, Canada, Chile, China, Japan, Mexico, New Zealand, Republic of Korea, Russian Federation and United States of America. At the seventh session of the Montreal Process Group in New Zealand in November 1995, the number of participating countries was increased to 12, with Argentina and Uruguay joining the process by official endorsement of the Santiago Declaration.

9/ Participating countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela.

10/ FAO and IUFRO have recently entered into a collaborative agreement related to clarifying and harmonizing basic, forest-related concepts and terms in use in various countries, within the overall framework of activities carried out within the framework of the global forest resources assessment programme coordinated by FAO.

11/ Several of the ongoing international initiatives, as well as the FAO/ITTO Expert Meeting on the Harmonization of Criteria and Indicators for Sustainable Forest Management, have made special reference to the terms and definitions developed within the framework of the Global Forest Resources Assessment Programme coordinated by FAO, which has been considered to constitute a useful framework for international activities in this regard.

12/ Discussion might include the desirability of reviewing the ITTO Guidelines and Criteria on sustainable management of moist tropical forests, which were the first to be developed at an international level, and which could potentially benefit from experiences and outcome of more recent initiatives. Discussion in this regard could also help to promote a stronger commitment to the Guidelines, and their further application by the ITTO producer countries.

13/ For a discussion on the possibilities of linking activities in sustainable forest management with the periodic assessment of the world's forests, see report related to programme element III.1 of the programme of work of the Panel (E/CN.17/IPF/1996/2).